

at one or more amino acid positions, said positions selected from the group consisting of Leu<sub>173</sub> ; Ala<sub>179</sub> , Met<sub>180</sub> , Arg<sub>181</sub> , Ser<sub>98</sub> , Ser<sub>255</sub> and Leu<sub>198</sub> in *Arabidopsis* or at an analogous amino acid residue in an EPSPS paralog;

b. identifying a cell having, a mutated EPSPS gene, which cell has substantially normal growth as compared to a corresponding wild-type plant cell; and

c. regenerating a non-transgenic herbicide resistant or tolerant plant from said plant cell.

15. (As Twice Amended) A method for producing a non-transgenic herbicide resistant or tolerant plant comprising

a. introducing into a plant cell a recombinagenic oligonucleobase to produce a mutant EPSPS gene that expresses an EPSPS protein that is mutated at one or more amino acid positions, said positions selected from the group consisting of Leu<sub>173</sub> ; Ala<sub>179</sub> , Met<sub>180</sub> , Arg<sub>181</sub> , Ser<sub>98</sub> , Ser<sub>255</sub> and Leu<sub>198</sub> in *Arabidopsis* or at an analogous amino acid residue in an EPSPS paralog;

b. identifying a cell having a mutated EPSPS gene, which encoded mutant EPSPS protein has substantially the same catalytic activity as compared to a corresponding wild type EPSPS protein; and

c. regenerating a non-transgenic herbicide resistant or tolerant plant from said plant cell.

20. (As Twice Amended) The method according to claim 14 in which the positions in the *Zea mays* paralog are selected from the group consisting of Leu<sub>97</sub> , Ala<sub>103</sub> , Met<sub>104</sub> , Arg<sub>105</sub> , Ser<sub>23</sub> , Ser<sub>179</sub> , and Leu<sub>122</sub>.

21. (As Twice Amended) The method according to claim 14 in which the positions in the *Brassica napus* paralog are selected from the group consisting of

22. (As Twice Amended) The method according to claim 14 in which the positions in the *Petunia hybrida* are selected from the group consisting of Leu<sub>169</sub>, Ala<sub>175</sub>, Met<sub>176</sub>, Arg<sub>177</sub>, Ser<sub>94</sub>, Ser<sub>251</sub> and Leu<sub>194</sub>.

**Please add the following new Claims 25, 26, 27 and 28:**

25. The method according to claim 15 in which the positions in the *Zea mays* paralog are selected from the group consisting of Leu<sub>97</sub>, Ala<sub>103</sub>, Met<sub>104</sub>, Arg<sub>105</sub>, Ser<sub>23</sub>, Ser<sub>179</sub>, and Leu<sub>122</sub>.

26. The method according to claim 15 in which the positions in the *Brassica napus* paralog are selected from the group consisting of Leu<sub>169</sub>, Ala<sub>175</sub>, Met<sub>176</sub>, Arg<sub>177</sub>, Ser<sub>94</sub>, Ser<sub>251</sub> and Leu<sub>194</sub>.

27. The method according to claim 15 in which the positions in the *Petunia hybrida* are selected from the group consisting of Leu<sub>169</sub>, Ala<sub>175</sub>, Met<sub>176</sub>, Arg<sub>177</sub>, Ser<sub>94</sub>, Ser<sub>251</sub> and Leu<sub>194</sub>.

28. A method for producing a non-transgenic herbicide resistant or tolerant plant comprising:

a. introducing into a plant cell a recombinogenic oligonucleobase to produce a mutant EPSPS gene that expresses an EPSPS protein that is mutated in two amino acid positions, said positions selected from the group consisting of Thr<sub>178</sub> and Pro<sub>182</sub>, in *Arabidopsis* or at an analogous amino acid residue in an EPSPS paralog wherein the Thr<sub>178</sub> is changed to Val or Leu and Pro<sub>182</sub> is changed to Ser;

b. identifying a cell having, a mutated EPSPS gene, which cell has substantially normal growth as compared to a corresponding wild-type plant cell; and

c. regenerating a non-transgenic herbicide resistant or tolerant plant